

Imagine cotton-fields—not with their usual fluffy white bolls of fiber—but with ones of olive green, or pumpkin, or deep russet. Imagine bolls so soft that they seem to melt on your fingertips.

This is not a fantasy from the Wizard of Oz. It's naturally colored cotton, and it grows worldwide in a variety of earth tones, eliminating the need for dyes.

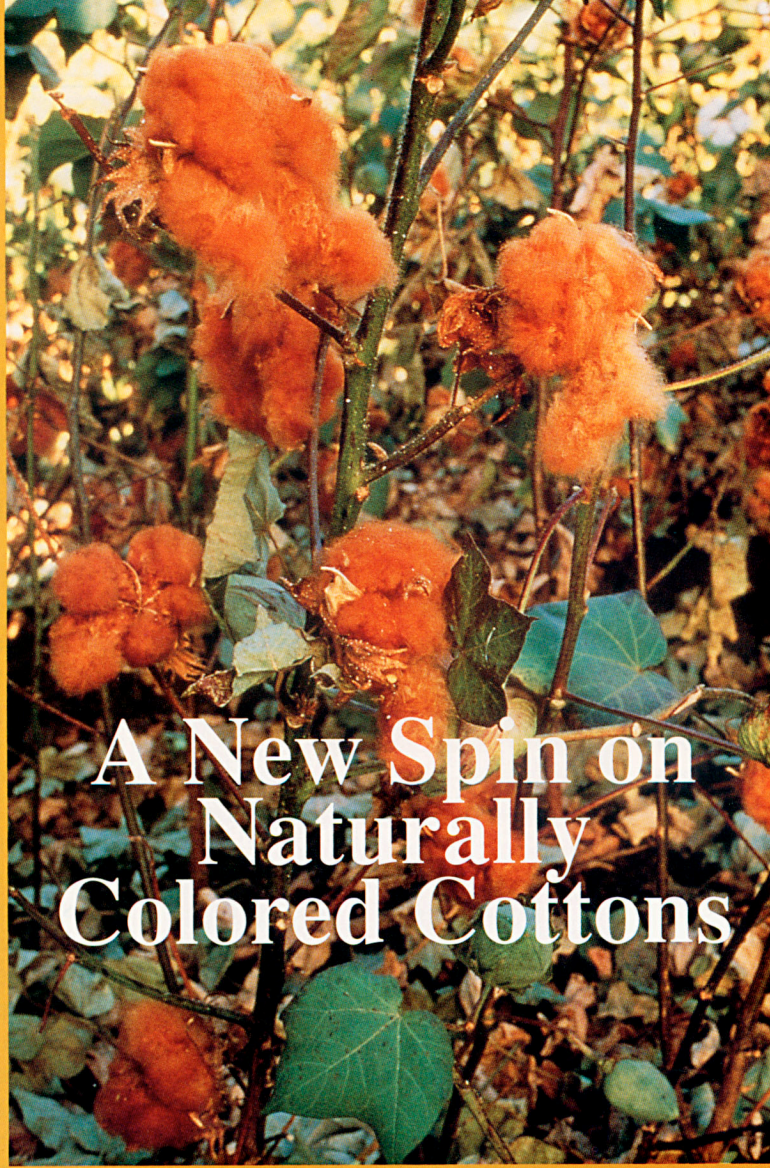
But these colorful fibers also tend to be shorter and weaker than white varieties, which limits their commercial prospects.

Naturally colored cotton is indigenous to many countries—from Russia to Peru. Many farming communities worldwide use the colored cottons to make blankets, curtains, and clothing. Historically, artisans have spun the fibers into yarn by hand to make cloth, including long-time Louisiana residents who have cultivated the plant for generations.

Louisiana also happens to be the place where Agricultural Research Service textile engineer Linda B. Kimmel is adapting patented yarn-making technology to enhance the strength and versatility of naturally colored cotton fabrics.

And this could help the market for colored cotton grow.

“Commercial processing of naturally colored cotton was not practical until breeders began improving the plants,” says Kimmel. “Although geneticists continue to improve their properties, the fibers remain comparatively short and weak.”



Naturally colored cotton bolls.

INGA SPENCE

As a result, spinning colored cotton yarn is difficult unless the colored fibers are mixed with white cotton. This kind of blending helps textile makers to process the fiber and strengthen the yarns, but it also reduces color intensity.

Yet colored cotton is still finding its way in the commercial world. While some previous ventures have failed, its novelty and softness keep a steady hold on niche markets. Today, its woody hues show up at rock concerts in the form of organic, earth-friendly, undyed T-shirts in muted color blends.

The future of colored cotton depends on a combination of successful plant breeding for enhanced fiber strength and the development of suitable manufacturing methods.

Kimmel, who is in the Cotton Textile Engineering Research Unit at ARS' Southern Regional Research Center (SRRC), is working cooperatively with Harvey Campbell of B.C. Cotton in Bakersfield, California, to develop improved colored cotton yarns and fabrics. Campbell is one of a handful of people in the United States who breed and grow colored cotton. His success depends on finding companies that want to produce colored cotton products.

“Naturally colored cotton has a wonderful hand,” says Campbell. “That’s an industry term for how it feels to the touch, and in this case it means almost irresistible.”

Campbell had heard about research at New Orleans where Kimmel and other scientists had developed several pioneering yarn spinning methods. The two met at a conference and decided to see what technology could do to improve colored cotton.

Kimmel is using two ARS-patented methods, staple-core and filament-core spinning, to produce composite yarns. Yarns made this way contain an outer layer of naturally colored fiber and an inner core of stronger white cotton or synthetic fibers. The result: a bicomponent yarn that contains two types of fibers that are securely sandwiched—instead of merely twisted—together. Consequently, the fabrics look and feel like solid colored cotton but are